CLAIMS

What is claimed is:

1. A process for synthesizing metal borohydride comprise the steps of:

Process of synthesizing the carriers of proton H or the carriers of catalysts for splitting hydrogen gas as proton H.

Process of generating and supplying proton H by the use of metals or alloys that can form hydrides with hydrogen. In this case, the metals or alloys are the carriers of proton H; Or providing proton H from the splitting of hydrogen gas by the use of catalysts located on the surface of carriers;

Process of synthesizing metal borohydrides by making the proton H enter the lattice of boron oxides and removing the oxygen from the lattice of boron oxides by the use of carriers.

Process of synthesizing metal borohydride alkali solution or pure metal borohydrides.

2. the invention of claim 1 wherein said the metals include Mg, V, Zr, Ti, La, Y, Ce, Ca, Nb or any materials that can form hydrides with hydrogen.

3. The invention of claim 1 wherein said the alloys can form hydrides with hydrogen include AB2, AB5, AB and A2B types of hydrogen storage alloys.

4. the invention of claim 1 wherein said the catalysts are Pt, Pd or any metals or alloys that can catalytic generate proton H from hydrogen gas. In this case, the carriers are Al, Fe, Mg, Zn, V, Zr, Ti, La, Y, Ce, Ca, Nb etc or any metal or alloys that can form oxides with oxygen.

5. The invention of claim 1 wherein said the method to make proton H enters the lattice of boron oxides from the carriers includes mechanical pulverization, heating or any methods that transfer energy to proton H to make it move from carriers to the lattice of boron oxides

6. the invention of claim 1 wherein said the methods to remove oxygen from the lattice of boron oxides is making the carriers to react with the oxygen atoms located in the lattice of boron oxides

7. the invention of claim 1 wherein said the boron oxides include no-aqueous borax, $NaBO_2$ or any other non-aqueous metal boron-oxides etc.

8. The invention of claim 2 wherein said the metals or alloys are those that can form hydrides and oxides respectively with hydrogen and oxygen, but have far greater chemical affinity to oxygen than to hydrogen.

9. The invention of claim 1 wherein said the process of synthesizing the carriers of proton H or the carriers of catalysts for splitting hydrogen gas as proton H include the following steps:

Mechanically mixing and pulverizing the metals or alloys said in claim 1 such as but not limited to magnesium with 0-50wt% hydrogen storage alloys

such as but not limited to FeTi to make the hydrogen storage alloys locate on the surface of carriers.

Mechanically mixing and pulverizing the mixed powders as mentioned above with 0-100wt% metals hydroxides such as but not limited to NaOH or KOH.

Surface capillary treatment. Put the powders produced by the above processes under water vapor with 0-1 atm for 0-48 hours.

Or mechanically mixing and pulverizing carriers metals or alloys said in claim 4 such as but not limited to aluminum with 0-10wt% catalysts as said in claim 4 such as Pt or Pd coated carbon black to make the Pt or Pd coated carbon black locate on the surface of carriers.

10. The invention of claim 1 wherein said the process of generating and supplying proton H include the following steps:

Keeping the powders produced from the above processes under 0-50 atm pressure hydrogen gas at from ambient temperature to 400°C for 0-48 hours. Or by the use of electrochemical or any other methods to produce proton H.

11. The invention of claim 1 wherein said the process of synthesizing metal borohydrides include the following steps:

Mechanically mixing and pulverizing non-aqueous metal boron oxides or borax with the powders produced by process as said in claim 10 under 0-50 atm

hydrogen gas existing at from ambient temperature to 400°C for 0-48 hours.

12. The invention of claim 1 wherein said the process of synthesizing metal borohydride alkali solution or pure metal borohydrides include the following steps:

Add alkali such as but not limited to KOH and NaOH solutions with concentration from 0.5wt% to saturate into the powders produced through the above processes as said in claim 9, 10 and 11.

Filter precipitates to obtain metal borohydride alkali solutions.

Or dissolve the powder produced through the above process as said in claim 9, 10 and 11 into liquid ammonia or any other liquid that can dissolve metal borohydrides

Filter precipitates and evaporate these liquid materials to obtain pure metal borohydride.